Differential growth of parasitized oak-apple galls of Cynips quercusfolii L. (Hymenoptera)

door

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In the winter of 1972—1973 three species of wasps were most numerous in oak-apple galls in the Netherlands viz., *Cynips quercusfolii* L. (Cynipidae), *Torymus nigricornis* Boh. (Chalcidoidea, Torymidae), and *Synergus pallicornis* Hartig (Cynipidae). The galls were collected at various sites viz., the sand dunes of Meyendel near The Hague and at Katwijk and Noordwijk (province of Zuid-Holland); and oak-groves near Elspeet and near Putten, province of Gelderland. The assistance of Prof. Dr. J. VAN DER VECHT, in collecting large samples of galls at Putten, is gratefully acknowledged. Collecting of galls was started in the end of August i.e., too late to observe more than the last phase of growth of the galls (see ASKEW, 1961, fig. 7). An increase of the percentage of galls parasitized could be observed in the dunes between August 24th and October 23rd. In the following table the percentages of these galls are given; the complements relate to galls with other parasites (galls moulded and those predated upon by birds are not included). In this period, the decrease of *Cynips* coincides with the increase of *Torymus*.

date	no. of galls	*Cynips*	*Torymus* only	*Torymus* + *Synergus*	complement
24.VIII	231	73	3	0	24
4.IX	376	47	19	2	32
18.IX	234	44	20	5	31
2.X	166	31	25	5	39
23.X	115	18	33	11	38

Even on December 20th the percentage of galls containing *Cynips* was much higher at Putten i.e., ca. 50 per cent.

The wasps species were identified on the larvae dissected from each gall, the diameter of which was noted. An analysis of the data thus obtained leads to the following conclusion. The galls inhabited by larvae of *Cynips quercusfolii* are distinctly larger than galls occupied by larvae of the parasite *Torymus nigricornis*. Galls in which the *Cynips* had been killed off by the *Torymus*, but which in addition contained larvae of the inquiline *Synergus pallicornis*, proved to be larger than the galls inhabited by *Torymus* only, although smaller than healthy *Cynips*-galls (fig. 1; probability in both instances larger than 95 per cent.). This situation was consistent at all sites and collecting dates, notwithstanding local variation in the size of the galls.

This observation can be explained by a continuous gall-forming influence from the larva of *Cynips*, ceasing at its death caused by the parasite. Apparently it can be substituted by some gall-forming influence from the larva of *Synergus*, although not to the full scale of the *Cynips*. It may be noted that KALDEWEY (1965) published on active substances extracted from the larvae of our three species, which

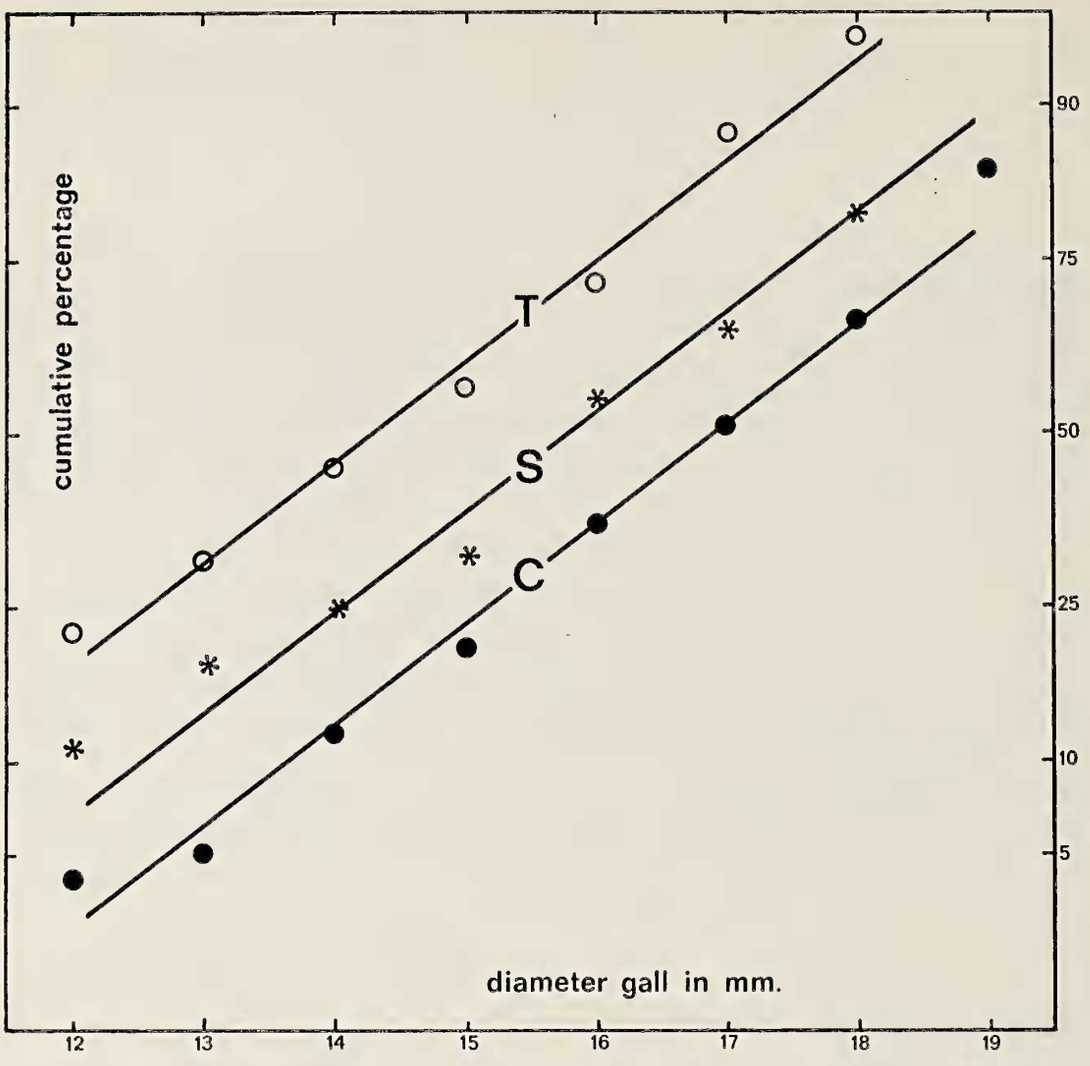

Fig. 1. Cumulative percentages (on a probability scale) of the diameter of galls containing larvae of *Cynips* (C), both *Torymus* and *Synergus* (S), or *Torymus* only (T). From a sample of 1161 galls collected at Elspeet (22.I.1973), 504 of which contained larvae of these species. Straight lines fitted by eye.

he found of approximately equal potency in an *Avena*-test. Judging from the morphology of the larval mandibles (fig. 2), it does seem probable that the scraping activity of both *Cynips* and *Synergus,* which have a more distinct molar edge than *Torymus,* may add to the formation of gall-tissue in oak-apples. A chemical activity was supposed by BOYSEN-JENSEN (1952) for the gall-midge *Mikiola fagi* Hartig.

Some gall-causing activity of *Synergus* might have been supposed on the ob-

Fig. 2. Larval mandibles of *Cynips quercusfolii* (C), *Synergus pallicornis* (S) and *Torymus nigricornis* (T).

servation of its forming discrete subsidiary cells. To deduce this activity from its results in the size of the galls, opens an attractive possibility for the quantification of the gall-forming influence.

References

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Dagvlinders in 1972

door

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Het afgelopen jaar telde ik in Nederland 33 soorten:

Papilio machaon L. Een vers exemplaar 5.VII te Heeze.

Pieris brassicae L. Op 26.VI nog 40 exemplaren op een braakliggende akker bij Wijlre. Late exemplaren van de eerste generatie op 28.VI bij Abcoude en 5.VII te Cadier. Ook de tweede generatie vloog nog lang door: op 3.IX nog twee exemplaren bij Ockenrode.

Pieris rapae L. Vloog het hele seizoen in klein aantal. De vierde generatie eind september te Utrecht, bovendien op 8.X nog drie verse exemplaren op Ockenrode.

Pieris napi L. Opvallend weinig. Op 28.VI nog een vrij vers mannetje te Abcoude.

Anthocharis cardamines L. Vrij talrijk bij Heino (Ov.) en Lemelerveld. Op 4.VI vlogen nog verse mannetjes.

Colias hyale L. Op 5.VI drie mannetjes (twee verse) op de vliegplaats te Wijlre. (In 1965 vlogen op de beschermde vindplaats verscheidene wijfjes, samen met *Spialia sertorius* Hoffmannsegg en *Erynnis tages* L. in de eerste week van juni; waarschijnlijk is *hyale* hier indigeen. Van 1966 tot 1971 heb ik het gebied niet bezocht.)

Gonepteryx rhamni L. Het eerste voorjaarsdier zag ik op 18.III te Oostvoorne, het laatste exemplaar op 17.VI te Veenendaal. Op de Kampina vlogen op 7.VI op één weitje nog vijf mannetjes en zes wijfjes.

Nymphalis polychloros L. Op 15.VII een vers exemplaar, Jabeek (L.).

Inachis io L. Opvallend talrijk in en rond Utrecht, eind augustus, begin september. Op 24.IX vlogen nog twee exemplaren op de Knardijk.

Vanessa atalanta L. Slechts zes exemplaren.

Cynthia cardui L. Idem.

Aglais urticae L. Eerste en laatste exemplaar te Oostvoorne: 18.III en 22.X, hoogste dagtotaal 15 exemplaren 24.IX, Knardijk. In 1971 was het maximum: ca. 350 exemplaren op luzerne, 6.IX, Wijlre.